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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,893	04/25/2001	Charles E. Wheatley III	QCPA453B1C1	6708

23696 7590 02/06/2007
QUALCOMM INCORPORATED
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EXAMINER

RYMAN, DANIEL J

ART UNIT	PAPER NUMBER
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2616

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	02/06/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	Application No. 09/841,893	Applicant(s) WHEATLEY ET AL.	
	Examiner Daniel J. Ryman	Art Unit 2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-16, 18-20, 32, 34, 36-39, 51, 53 and 55-57 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-16 and 18-20 is/are allowed.
- 6) ☒ Claim(s) 32, 34, 36-38, 51, 53 and 55-57 is/are rejected.
- 7) ☒ Claim(s) 36-39, 51 and 55-57 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. The indicated allowability of claims 32, 34, 36-39, 51, 53, and 55-57 is withdrawn in view of the newly discovered reference(s) to Chung et al. (USPN 5,642,377) and in view of a reinterpretation of the claims. While Examiner previously assumed that the transmitter of the Base Station was disabled throughout the entire synchronization process, the claims actually only require that the transmitter be disabled for “a transmission”. Rejections based on the newly cited reference(s) and the reinterpreted claims follow.
2. Applicant's arguments with respect to claims 32, 34, 36-39, 51, 53, and 55-57 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claim 36 is objected to because of the following informalities: in line 2, “with at least one other” should be “with the timing of at least one other” since the timing of the base station is synchronized with *the timing* of the at least one other base station. Appropriate correction is required.
4. Claim 37 is objected to because of the following informalities: in line 2, “with the at least one other” should be “with the timing of the at least one other” since the timing of the base station is synchronized with *the timing* of the at least one other base station. Appropriate correction is required.
5. Claim 38 is objected to because of the following informalities: in line 2, “with the at least one other” should be “with the timing of the at least one other” since the timing of the base

station is synchronized with *the timing* of the at least one other base station. Appropriate correction is required.

6. Claim 39 is objected to because it incorporates the method as claimed in claim 1, where claim 1 is a cancelled claim. Appropriate correction is required.

7. Claim 51 is objected to because of the following informalities: in line 6, “of the mobile” should be “of a mobile” since “the mobile station” lacks antecedent basis. Appropriate correction is required.

8. Claim 55 is objected to because of the following informalities: in line 6, “with at least one” should be “with the timing of at least one” since the timing of the base station is synchronized with *the timing* of the at least one base station. Appropriate correction is required.

9. Claim 56 is objected to because of the following informalities: in line 2, “with at least one” should be “with the timing of the at least one” since the timing of the base station is synchronized with *the timing* of the at least one other base station. Appropriate correction is required.

10. Claim 57 is objected to because of the following informalities: in line 2, “with at least one” should be “with the timing of the at least one” since the timing of the base station is synchronized with *the timing* of the at least one other base station. Appropriate correction is required.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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12. Claims 38 and 57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Claims 38 and 57 require that the synchronization process be repeated “for all mobile stations within the coverage area of the base station.” However, claims 36 and 55, which claims 38 and 57 depend upon, respectively, each require that the synchronization process be conducted using a mobile station communicating with the base station and at least one other base station. Examiner further assumes that not all mobile stations within the coverage area of the base station will be in communication with an additional base station, i.e. some mobile stations in the coverage area of the base station will be capable of communicating only with the base station. This assumption is based on the fact that in order to be able to communicate with two base stations, a mobile station needs to be located at a position in which it can “hear” both base stations. Therefore, it is unclear how the synchronization process can be repeated for all mobile stations within the coverage area of the base station when not all of these mobile stations will be capable of communicating with multiple base stations, as required by the synchronization process. Since Examiner is unable to determine the metes and bounds of this claim, Examiner will not examine these claims for the purposes of 35 U.S.C. 102 and 103.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 32 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dupuy et al. (USPN 6,072,847), of record, in view of Ariyoshi et al. (USPN 5,930,244), of record.

16. Regarding claims 32 and 51, Dupuy discloses a method and apparatus for synchronizing a base station with a wireless communication system upon the base station's power up, comprising: disabling a transmission from the base station (col. 4, lines 31-39, where the controller C commands the transmitter E to stop transmitting during certain time slots); obtaining initial timing at the base station in accordance with a timing signal provided from a base station controller (col. 5, lines 8-12, where the mobile switching center provides an initial timing to each base station through a base station controller, col. 5, lines 1-7 and Fig. 5, i.e. the MSC connects to the BTS through the BSC so that the timing signal is "provided" by to the BTS by the BSC); receiving at the base station signals transmitted from a mobile station (col. 6, lines 4-8, where the mobile station transmits to the base station information to correct the base station's timing); and adjusting timing of the base station in accordance with a time offset between an estimated reception time of the base station and an actual reception time of the base station (col. 5, lines 21-32, where the mobile station determines a "propagation time" which is a difference between an estimated reception time and an actual reception time).

Dupuy does not expressly disclose adjusting timing of the base station in accordance with a time offset between an estimated PN offset of the mobile station and an actual PN offset of the mobile station. Rather, Dupuy discloses adjusting timing of the base station in accordance with a time adjustment signal sent by a mobile station in a manner that consumes a minimal amount of bandwidth (col. 6, lines 4-14). In addition, while Dupuy's primary embodiment encompasses a TDMA system (col. 1, lines 18-22), Dupuy discloses that this synchronization system can be used

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in any cellular mobile radio systems (col. 1, lines 13-17, where Dupuy broadly states that the invention is applicable to cellular mobile radio systems, and claim 1, which is not limited to a TDMA system). Ariyoshi teaches, in a CDMA system, having one station determine a timing adjustment in accordance with a time offset between an estimated PN offset and an actual PN offset (col. 2, lines 48-54, where the base station determines the difference between a reception reference phase, i.e. an estimated PN offset, and a reception signal phase, i.e. an actual PN offset, which indicates the difference in timing between the base station and the mobile station). While in Ariyoshi's system the phase difference is transmitted by the base station to the mobile stations to permit the mobile stations to correct their phase (col. 2, lines 48-54), such a transmission is not necessary if Ariyoshi's system were combined with Dupuy since in this combined system the base station, rather than the mobile station, needs the correction. Further, Ariyoshi teaches that CDMA "considerably improv[es] the use efficiency of communication frequencies" (col. 1, lines 30-32). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Dupuy's system with Ariyoshi's CDMA timing system in order to permit a CDMA base station to have its timing corrected using the timing of a reference base station, as in Dupuy, in a manner that involves little signaling, as outlined in Ariyoshi.

17. Claims 34, 36, 37, and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dupuy et al. (USPN 6,072,847), of record, in view of Chung et al. (USPN 5,642,377) in further view of Gudmundson et al. (USPN 5,295,152).

18. Regarding claims 34 and 53, Dupuy discloses a method and apparatus for synchronizing a base station with a wireless communication system upon the base station's power up, comprising: disabling a transmission from the base station (col. 4, lines 31-39, where the controller C

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commands the transmitter E to stop transmitting during certain time slots); obtaining initial timing at the base station in accordance with a timing signal provided from a base station controller (col. 5, lines 8-12, where the mobile switching center provides an initial timing to each base station through a base station controller, col. 5, lines 1-7 and Fig. 5, i.e. the MSC connects to the BTS through the BSC so that the timing signal is "provided" by to the BTS by the BSC); receiving at the base station signals transmitted from a mobile station (col. 6, lines 4-8, where the mobile station transmits to the base station information to correct the base station's timing); adjusting timing of the base station in accordance with the received signals (col. 2, lines 53-58, where the base station adjusts timing of the base station in accordance with this signal).

Dupuy does not expressly disclose providing the mobile station with a pilot PN code offset of the base station. However, Dupuy does disclose that the mobile station "listen[s] to said reference base transceiver station and said subordinate base transceiver station" (col. 5, lines 20-22). In addition, while Dupuy's primary embodiment encompasses a TDMA system (col. 1, lines 18-22), Dupuy discloses that this synchronization system can be used in any cellular mobile radio system (col. 1, lines 13-17, where Dupuy broadly states that the invention is applicable to cellular mobile radio systems, and claim 1, which is not limited to a TDMA system). Examiner takes official notice that CDMA communication systems are well known in the art as a way to improve the use efficiency of communication frequencies. Chung teaches, in a wireless communication system, that in order for a mobile to communicate with a base station the mobile must know the PN offset of the base station (col. 7, lines 10-19). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Dupuy's synchronization system in a CDMA system since this improves the use efficiency of communication frequencies, where in such

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a system the mobile station would be provided with a pilot PN code offset of the base station to enable the mobile to communicate with the base station.

Dupuy in view of Chung does not expressly disclose transmitting signals at successively increasing power levels from the base station in accordance with the adjusted timing until the mobile station detects the transmitted signals. However, Dupuy in view of Chung does disclose transmitting signals from the base station in accordance with the adjusted timing (Dupuy: col. 6, lines 34-39, where the subordinate base station adjusts its timing and where it is implicit that the base station will then use this timing when transmitting subsequent signals). Gudmundson teaches, in a mobile communication system, transmitting signals at successively increasing power levels from one unit until the other unit detects the transmitted signals in order to prevent a communication link from using an unnecessarily high power and interfering with other communications (col. 2, lines 41-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to transmit signals at successively increasing power levels from the base station until the mobile station detects the transmitted signals to minimize the amount of interference in the system.

19. Regarding claim 36, Dupuy in view of Chung in further view of Gudmundson discloses synchronizing timing of the base station with at least one other base station, communicating with the mobile station (Dupuy: col. 5, lines 33-36, where the subordinate base station is synchronized to a reference base station).

20. Regarding claim 37, Dupuy in view of Chung in further view of Gudmundson discloses that said synchronizing timing of the base station with the at least one other base station communicating with the mobile station comprises: initiating a communication between the base

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station and the mobile station (Dupuy: col. 5, lines 21-26, where the mobile station initiates communication with both the reference and the subordinate base stations); measuring a first propagation delay interval of transmissions from the base station to the mobile station in communication with the base station and back from the mobile station to the base station (Dupuy: col. 5, lines 27-32, where the mobile station determines the propagation time difference between the mobile station and each of the base stations); measuring a second propagation delay interval of transmissions from the at least one other base station communicating with the mobile station and back from the mobile station to the at least one other base station communicating with the mobile station (Dupuy: col. 5, lines 27-32, where the mobile station determines the propagation time difference between the mobile station and each of the base stations); measuring at the mobile station a time difference between the time of receipt of a transmission from the at least one other base station communicating with the mobile station and the time of receipt of a transmission from the base station communicating with the mobile station (Dupuy: col. 5, lines 24-26, where the mobile station determines a time shift between the two base stations as seen from the mobile station); and computing a timing correction value based upon, said measured first propagation delay interval, said measured second propagation delay interval, and said measured time difference (Dupuy: col. 5, line 66-col. 6, line 7, where the "time shift to be corrected" is calculated).

Dupuy in view of Chung in further view of Gudmundson does not expressly disclose measuring a round trip delay interval rather than a propagation delay interval between the mobile and the base stations. However, Examiner takes official notice that propagation times are typically determined based on round trip delay intervals since an easy way to determine the time it takes for a message to travel from point A to point B, i.e. the propagation time, is to take the time it takes a

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message to travel from point A to point B and back, i.e. the round trip time, and then halve it.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to measure a round trip delay interval since a propagation delay interval can be easily determined from a round trip delay interval, which is an easily measurable parameter.

21. Claims 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dupuy et al. (USPN 6,072,847), of record.

22. Regarding claim 55, Dupuy discloses an apparatus for synchronizing a base station with a wireless communication system upon the base station's power up, comprising: a transmitter (col. 4, lines 31-39, where the base transceiver station has a transmitter E); a processor communicatively coupled to the transmitter (col. 4, lines 31-39, where the transmitter E is controlled by controller C), wherein the processor executes a set of instructions to adjust timing of the base station in accordance with received signals (col. 6, lines 4-7, where the base station adjusts its timing using the timing adjustment transmitted by the mobile station, and where it is implicit that the controller of the transmitter adjusts the transmitter's timing), and to synchronize timing of the base station with at least one base station communicating with a mobile station (col. 5, lines 33-36, where the timing of the subordinate base station is synchronized with the timing of the reference base station, and where each of these base stations are connected to the mobile station, col. 21-32); a receiver, communicatively coupled to the processor, configured to receive the received signals transmitted from the mobile station (col. 6, lines 4-7, where it is implicit that the base station receives the signals transmitted by the mobile station using a receiver); and the processor disabling the transmitter and obtaining initial timing (where the processor disables the transmitter, col. 4, lines 35-39, and

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where the processor obtains initial timing sent from an MSC through a BSC, Fig. 5 and col. 5, lines 1-12).

Dupuy does not expressly disclose having a storage medium coupled to the processor containing a set of instructions executable by the processor. However, Examiner takes official notice that it is well known in the art to provide a storage medium coupled to a processor for storing a set of instructions executable by the processor in order to enable the processor to perform a variety tasks. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have a storage medium coupled to the processor containing a set of instructions executable by the processor in order to enable the processor to perform a variety of tasks.

23. Regarding claim 56, Dupuy discloses that the processor synchronizes timing of the base station with at least one base station communicating with the mobile station by executing a set of instructions to: initiate a communication between the base station and the mobile station (col. 5, lines 21-26, where the mobile station initiates communication with both the reference and the subordinate base stations); measure a first propagation delay interval of transmissions from the base station to the mobile station in communication with the base station and back from the mobile station to the base station (col. 5, lines 27-32, where the mobile station determines the propagation time difference between the mobile station and each of the base stations); measure a second propagation delay interval of transmissions from the at least one base station communicating with the mobile station and back from the mobile station to the at least one base station communicating with said mobile (col. 5, lines 27-32, where the mobile station determines the propagation time difference between the mobile station and each of the base stations); and compute a timing correction value in accordance with the first propagation delay

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interval, the second propagation delay interval, and a time difference provided by the mobile station (col. 5, line 66-col. 6, line 7, where the "time shift to be corrected" is calculated and where Dupuy discloses performing such a calculation in the base station, col. 6, lines 34-42); and wherein the mobile station is configured to: measure the time difference between the time of receipt of a transmission from the at least one base station communicating with the mobile station and the time of receipt of a transmission from the base station (col. 5, lines 24-26, where the mobile station determines a time shift between the two base stations as seen from the mobile station).

Dupuy does not expressly disclose measuring a round trip delay interval rather than a propagation delay interval between the mobile and the base stations. However, Examiner takes official notice that propagation times are typically determined based on round trip delay intervals since an easy way to determine the time it takes for a message to travel from point A to point B, i.e. propagation time, is to take the time it takes a message to travel from point A to point B and back, i.e. round trip time, and the halve it. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to measure a round trip delay interval since a propagation delay interval can be easily determined from a round trip delay interval, which is an easily measurable parameter.

Allowable Subject Matter

24. Claims 11-16 and 18-20 are allowed. The prior art does not disclose or fairly suggest having a base station calculate a timing correction value based upon an estimate of a delay between a mobile unit and the base station, the time of reception by the base station of a signal sent from the mobile unit as determined by the base station, and a measured round trip delay

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interval between the mobile unit and another base station, where this round trip delay interval is measured by the another base station.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Ryman whose telephone number is (571)272-3152. The examiner can normally be reached on Mon.-Fri. 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571)272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Daniel J. Ryman
Examiner
Art Unit 2616

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